

NODE
LABS



2/19

2:00 PM - 3:00 PM

BIG SEXY
BREWING COMPANY
5861 88TH ST #800
SACRAMENTO, CA
95828

WHERE CANNABIS AND TECH INTERSECT

Chris
Leavitt

CSO,
NODE LABS +
COMPOUND GENETICS

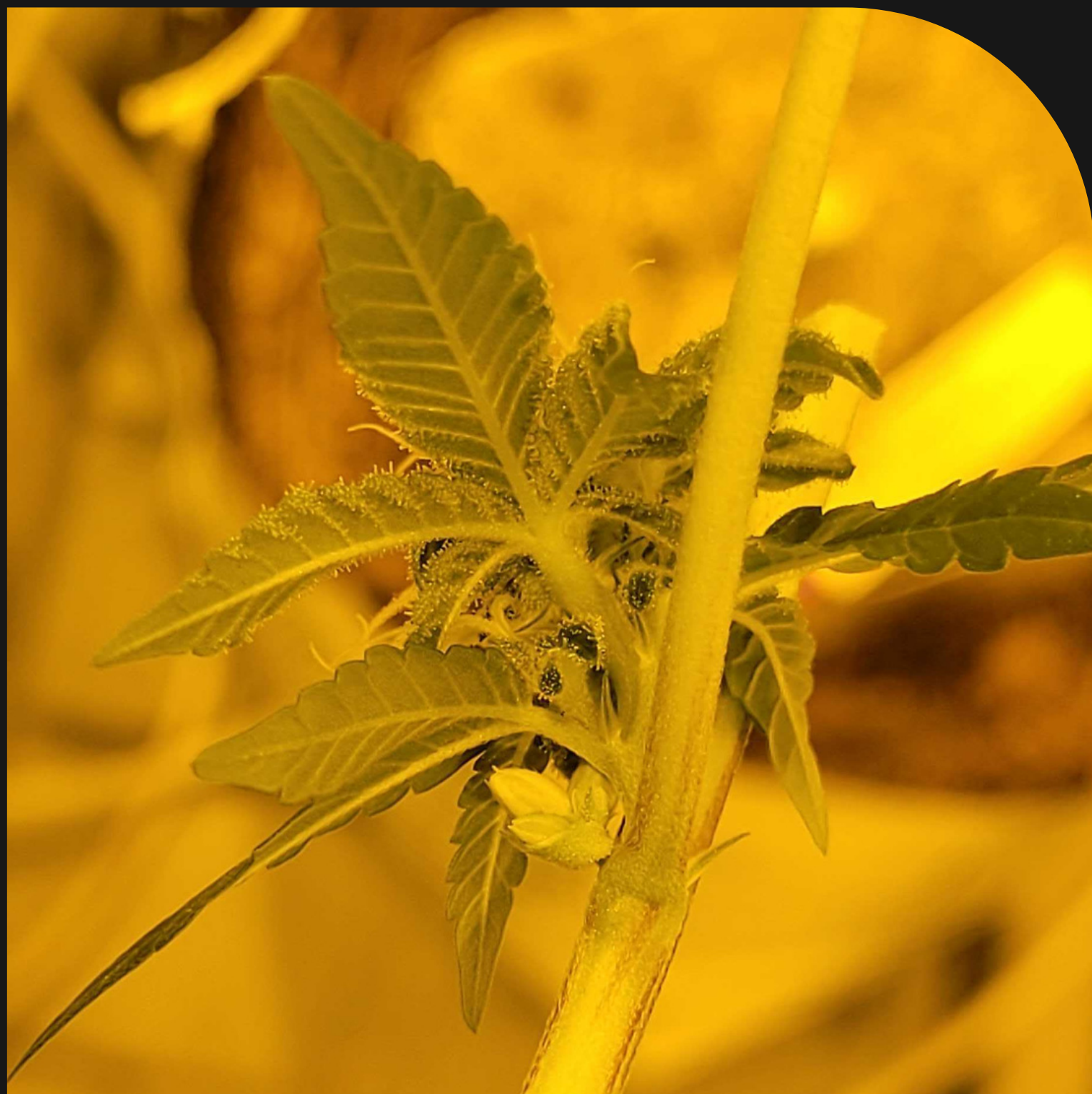
@FlavorsOfScience

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PREVENTING INTERSEX TRAITS WHEN GROWING FROM SEEDS AND CLONES





INTRODUCTION

INTERSEX TRAITS (HERMAPHRODITES) ARE A WELL-KNOWN OCCURRENCE IN CANNABIS PLANTS, ESPECIALLY WHEN GROWING FROM SEED. THIS IS AN UNFAVORABLE TRAIT BECAUSE POLLINATION CAN OCCUR, WHICH INTERFERES WITH THE QUALITY OF THE FLOWER.

WHY DO HERMS EXIST?

SEX EVOLVED BECAUSE THERE IS A
SIGNIFICANT EVOLUTIONARY ADVANTAGE TO
RECOMBINATION OF DNA- HYBRID VIGOR

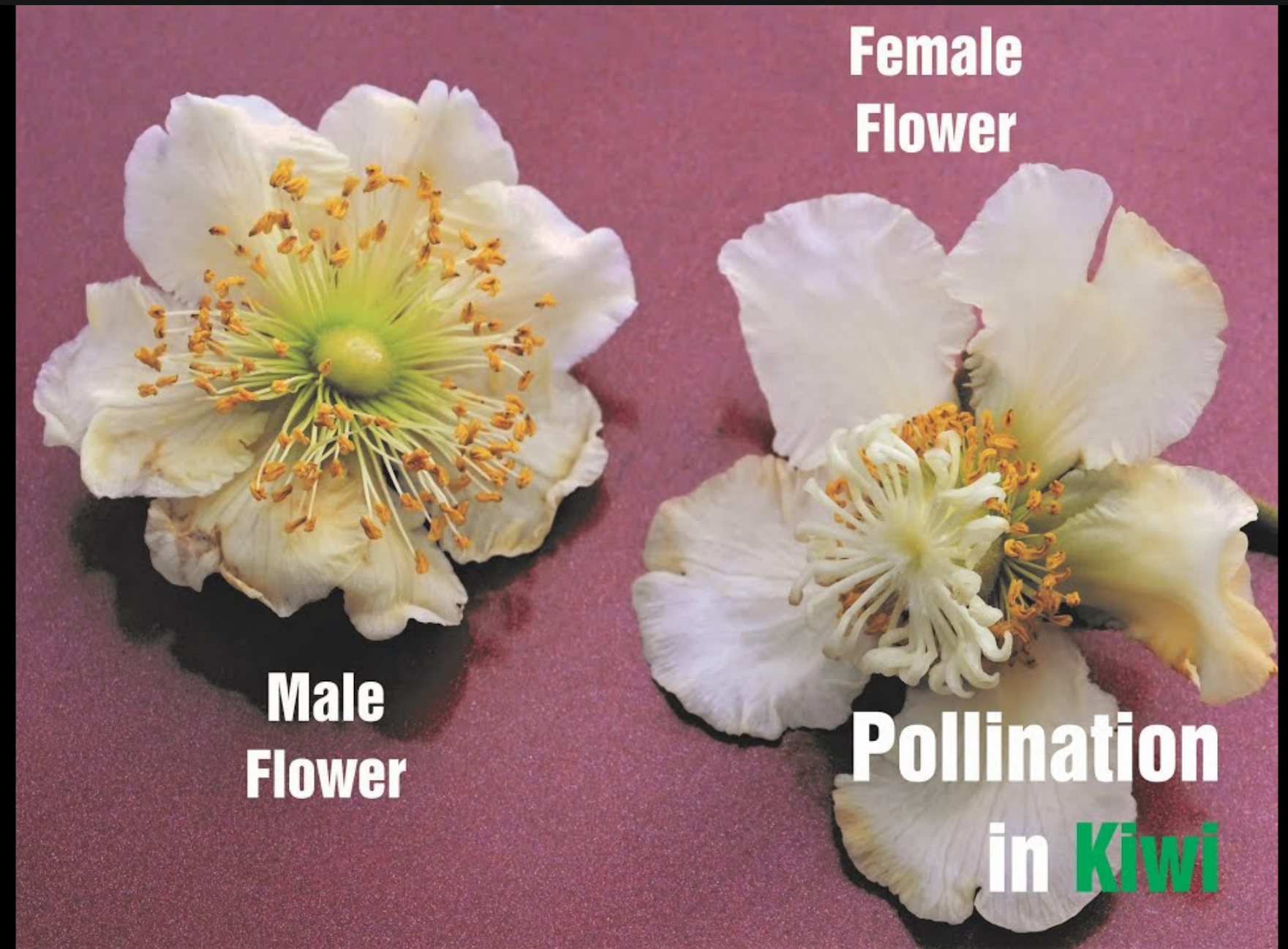
ESPECIALLY IMPORTANT FOR REDUCING
SUSCEPTIBILITY TO DISEASE AND PARASITES

REGARDLESS, REPRODUCTIVE ADVANTAGE IS
STILL THE MOST ASPECT OF EVOLUTION, SO
GUARANTEEING REPRODUCTION THROUGH
HERMAPHRODISM IS EXTREMELY COMMON

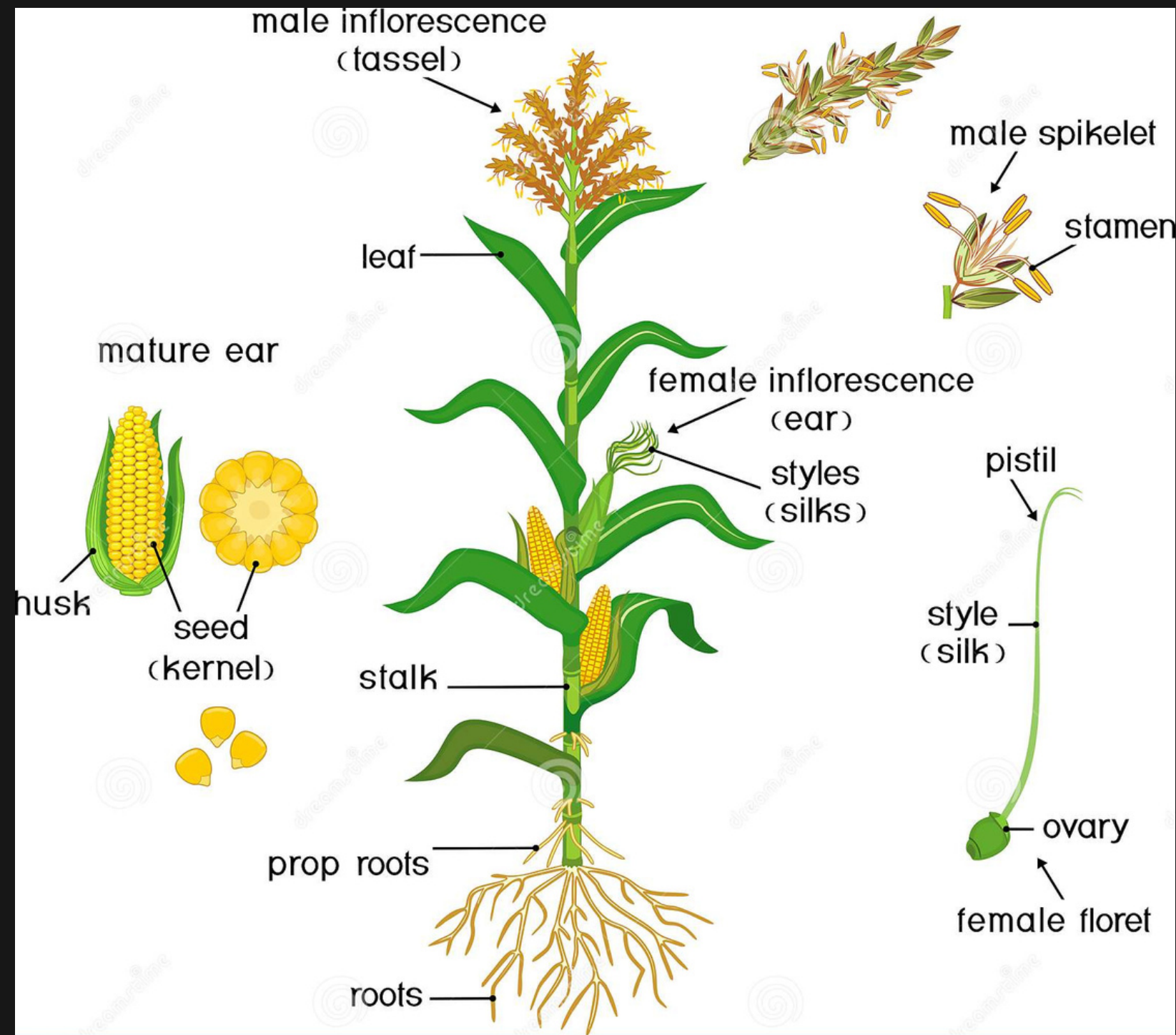


HERMS IN NATURE

Of all flowering plants...
94% are monoecious
72% have perfect
(hermaphroditic) flowers
Only 6% dioecious!



EVOLUTION OF DIOECY



" SEPARATE SEXES (DIOECY)...HAVE EVOLVED RELATIVELY RECENTLY FROM HERMAPHRODITIC ANCESTORS."

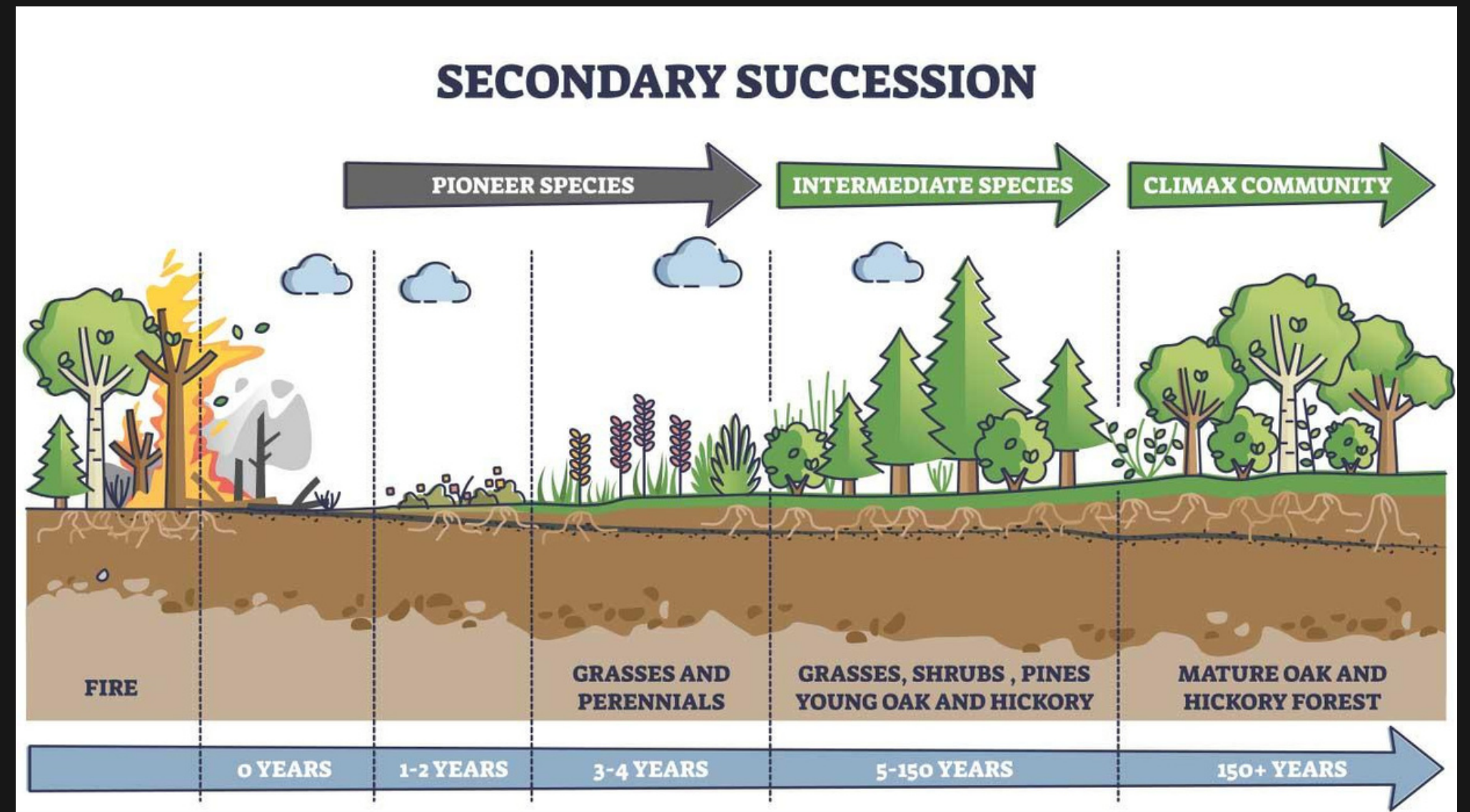
SEX DETERMINATION

L. ROSS, H. BLACKMON, IN ENCYCLOPEDIA OF EVOLUTIONARY BIOLOGY, 2016

EVOLUTIONARY RATIONAL FOR RETAINING HERM TRAITS

Cannabis is a pioneer species

- A single-plant patch can still create a colony
- Unfavorable conditions can still result in reproduction
- Plant can take advantage of disturbance events more readily
- Signals to take advantage of these conditions are stress factors!!



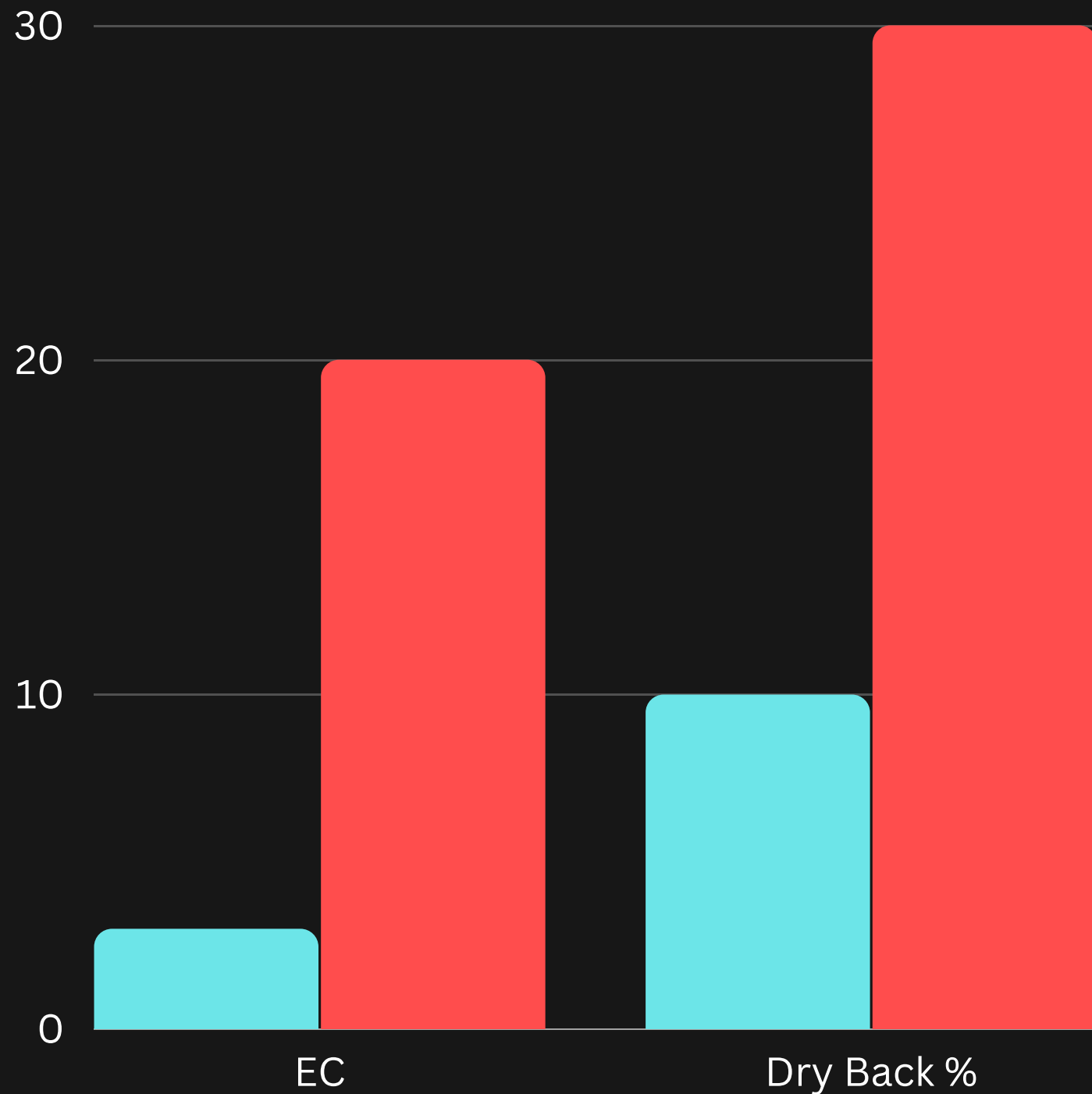
MECHANISM FOR HERM INDUCTION

Ethylene gas increases female flowers and absence of ethylene induces male flowers

- Ethylene is a critical plant hormone for many important functions, and impacts flower formation only during flower induction phase



S T R E S S



20 EC AND 30% DRYBACKS : EVERY PLANT EXPRESSED MALE FLOWERS.

THIS DEMONSTRATES THAT THERE IS A PROPENSITY FOR INTERSEX TRAITS THAT VARIES AMONGST INDIVIDUALS AND CERTAIN CONDITIONS, BUT THAT ACCORDING TO OUR RESEARCH, ALL CANNABIS PLANT POSSESS THE ABILITY TO HERM



W H E N G R O W I N G F R O M S E E D

FACTORS MAY INCREASE THE EXPRESSION OF INTERSEX TRAITS REGARDLESS OF THE GENETIC PROPENSITY OF THE PLANT PHENOTYPE. IN THIS DOCUMENT, WE WILL SHARE TECHNIQUES TO HELP REDUCE STRESS AND HELP PREVENT INTERSEX TRAITS IN SEEDS TO HAVE SUCCESSFUL FLOWERING AND INCREASE SUCCESS OF GROWING GREAT CANNABIS FLOWER

COMPONENTS OF STRESS

WHAT FACTORS IMPACT HERMS?

- NUTRIENT CONCENTRATION, TYPE, AND COMPOSITION**
- PHOTOPERIOD INTERRUPTION**
- ENVIRONMENT**
- LIGHT INTENSITY**
- IRRIGATION STRATEGY**
- ENDOGENOUS HORMONES**
- GENETICS**

FACTORS THAT INCREASE INTERSEX TRAIT EXPRESSION (STRESS FACTORS)

Nutrient Concentration, Type, Composition

More likely to herm

- High EC nutrients
- High nitrogen nutrient solutions
- Inorganic nutrients
- Lack of organic amendments
- Adding many different additives and amendments that have an unknown combined effect

Less likely to herm

- Low EC and organic nutrients
- Low nitrogen solutions
- Inorganic nutrients
- Bio-active amendments such as humic and fulvic acids, and compost teas
- Reducing inputs and amendments to a simple recipe- don't stack additives

FACTORS THAT INCREASE INTERSEX TRAIT EXPRESSION (STRESS FACTORS)

Photoperiod Interruption

More likely to herm



Light leaks, turning
the lights on at night
or having lights turn
off during the day

Less likely to herm



Keep the light cycle
constant and reduce
light leaks

FACTORS THAT INCREASE INTERSEX TRAIT EXPRESSION (STRESS FACTORS)

Environment

More likely to herm

- High VPD
- High Temps
- Low Humidity
- Faster Transpiration and higher likelihood of water stress

Less likely to herm

- Moderate VPD
- Moderate Temps
- Moderate Humidity
- Conditions that aren't likely to cause water stress

FACTORS THAT INCREASE INTERSEX TRAIT EXPRESSION (STRESS FACTORS)

Light Intensity

More likely to herm



1,000 ppfd or above

Less likely to herm



Moderate light levels
of 750-900 ppfd

FACTORS THAT INCREASE INTERSEX TRAIT EXPRESSION (STRESS FACTORS)

Irrigation and Substrate

More likely to herm

- Generative with hard drybacks
- Drought stress
- Rockwool or other substrates with higher wilt/water content
-
-

Less likely to herm

- Vegetative with gentle drybacks
- Avoiding drought stress
- Organic substrates and coco
-
-

FLOWERING THE SEEDLING OR FLOWERING A CLONE OF THE SEEDLING?

Hormonal differences
between clones and
seedlings

- Gibberellins
- GA/Ethylene cross talk



STRESSOMETER

Crop Steering and Herm Propensity

Generative

Vegetative



Intersex Traits

THANK YOU!

Join our Discord!!!